The Newtonian Constant of Gravitation.

I SHOULD be obliged if you would allow me to make a correction in my lecture at the Royal Institution, published in NATURE, Aug. 2, 9, and 23, on page 331. I have stated that in pieces of apparatus geometrically similar but of different dimensions, the disturbances due to uncertain convection currents are likely to be in the proportion of the seventh power of the linear dimensions. Having discussed this at some length lately with Prof. Poynting, I find that I was in error, and that in reality the disturbances would be proportional to the fifth power of the linear dimensions if the circulation of the air were so extremely slow as to be steady. If, however, its velocity were sufficient to give rise to unsteadiness, the rate at which momentum would be given to the suspended portion of the apparatus would depend on the square of the velocity, at least in part, and as the part depending on the square increased in importance the disturbance would gradually rise to the eighth power. So long, therefore, as the apparatus is small enough to prevent terms involving the square of the velocity from being appreciable, the ratio of the disturbance to the couple to be measured or the stability is the same whatever the size; but as soon as the apparatus exceeds this, then the disadvantage of size very rapidly becomes evident.

Of course the objection due to the great increase of time which must elapse between the handling of apparatus and its being fit for observations to be made, which accompanies increase of size, remains.

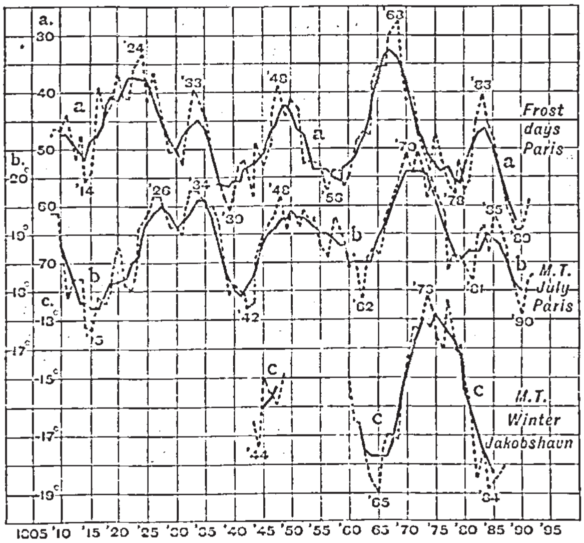
As the consideration of the relation between disturbance and couple to be measured, and its variation with linear dimensions, is a matter of great importance in the design of most instruments in which the movements of a suspended system supply the means of measurement, there is an additional reason for correcting in these columns the error that I made.

C. V. BOYS.

On Some Temperature-Variations in France and Greenland.

THE relations indicated in the diagram sent herewith are, I think, instructive; and they might perhaps be found to contain some useful clues to coming weather.

This diagram has two kinds of curves, dotted line, and continuous. Both are *smoothed* curves. In the former, the actual values have been smoothed with averages of five; and in the latter, those averages have, in their turn, been treated in the same way. High points in all the curves denote heat; low points cold.



The first pair of curves (a) show, by averages, the variation in the number of frost days in Paris in October to April of each cold season since 1806. (I designate each cold season by the year in which it *ends*; 1806 meaning 1805 6, &c.). These are *inverted* curves, the numbers increasing downwards. They present a succession of (say) five obvious waves, which, with regard to the crest intervals, are neither wholly regular nor wholly irregular, the intervals of the smoother curve being, in series, 12, 15, 18, and 17 years.

The second pair of curves (b) show the variation in mean temperature of July at Paris during the same period; and we may perceive in these a general correspondence to the first curves, with, however, a distinct tendency to lag somewhat.

There is a good deal of general similarity, of course, between the weather of Paris and our own, and between the longer waves of variation of July and those of the whole summer. Hence we find, *e.g.*, that a once-smoothed curve of mean temperature of summer at Greenwich presents obvious minima in the years 1814, 1839, 1862, and 1881. Compare this with the Paris July curve.

It is known that in our climate a severe winter tends to be followed by a cool summer; but the facts here presented are, it will be perceived, of a somewhat different order, and wider scope.

The third pair of curves (c) relate to Jakobshavn, on the west coast of Greenland, and show the smoothed variations in mean temperature of winter (December–February) for a series of years. These curves are short compared with the others, and are interrupted at one part; but so far as they go, they seem to present a similar variation, with further lag; so that, as compared with the Paris frost curve, we find the phases have come to be nearly opposite. Our European winters, indeed, seem to be generally opposite to those of Greenland. This is pointed out, as regards Vienna, by Dr. Hann in the paper from which those Jakobshavn figures are obtained. (*Met. Zeits.* 1890, p. 113.)

By way of comparing these curves, it may be useful to note the lowest points of the three once-smoothed curves; and the intervals between those of the same curve and of different curves. (The intervals, in years, are given in brackets.)

Paris, frost, 1814 (25), 1839 (17), 1856 (22), 1878 (11), 1889
(1) (3) (6) (3)
Paris, July, 1815 (27), 1842 (20), 1862 (19) 1881 (9), 1890
(2) (3) (3)
Jakobshavn, winter, 1844 (21), 1865 (19), 1884.

The fact of this lagging correspondence would appear to suggest that the general variations of our winter seasons are, in some measure, a key to those of approaching summers, and also, if the Jakobshavn correspondence were confirmed by a longer series of data, to those of approaching winters in Greenland.

An explanation of these curious facts may perhaps be supplied by those who have a comprehensive knowledge of polar meteorology and its relations.

A. B. M.

New Element in the Sulphur Group.

DR. B. BRAUNER, of Prag, in 1888 made a careful investigation of the atomic weight of tellurium, an account of which will be found in *C. S. J.* 320, p. 382. In accordance with Messrs. Newland's and Mendeléef's Periodic Law, tellurium should have, if pure, an atomic weight of 125, or even lower.

Prof. D. Mendeléef takes Sb = 122, Te = 125, I = 127. Taking the latest numbers for antimony and iodine (Sb = 120, I = 126·8), Dr. Brauner proceeds to investigate the atomic weight of Te, for which he finds by a great number of experiments the number 127·65. As is only to be expected from such a staunch advocate of the Periodic Law, he at once came to the conclusion that neither himself nor former experimenters (Berzelius, in 1812, 1818 and 1832; von Hauer, in 1857, &c.) had been dealing with the pure element. As he puts it, tellurium is not an element.

Tellurium prepared from the dibromide gave the high atomic weight of 130. Prepared from the tetrabromide, which latter was distilled in vacuo, the resulting element being distilled in a current of hydrogen, Te = 127·65. Under these circumstances, he says, no doubt one constituent of "tellurium" partly escapes, thus reducing the atomic weight. He terms tellurium the gadolinium of the sulphur group.

In the following year, 1889, Prof. Mendeléef predicted (Faraday Lecture, *C. S. J.* 323, p. 649) an element with atomic weight 212, which he calls Dvi-(=Bi-) tellurium, for which he suggests the symbol Dt, and predicts the following

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characters: it will be capable of forming an oxide RO_3; its hydride, if it exists, will be even more unstable than tellurium hydride; its compounds will be easily reduced; it will form definite alloys with metals; and have the specific gravity of about 9·3. Since then Prof. W. Preyer, in his "Genetisches System der chemischen Elemente," Berlin, 1893, p. 100, among unknown elements, gives one in the sulphur group, thus predicted by Mendeléef. He goes into further details, representing the atomic weight as 213; specific gravity, 8·6; atomic volume, 24·7; specific heat, 0·03; electro-negative, divalent, diamagnetic.

A. Grünwald (B^l. 1891, 5, p. 21) appears to have seen the spectrum of this element, whilst observing spectra of tellurium, copper and antimony.

Norwegium is considered by some chemists to be this missing element; Dr. Preyer is not of that opinion, regarding the claims of norwegium to be considered an element to be insufficiently supported.

In consideration of Dr. Brauner's work on the atomic weight of tellurium, and the priority of his suggestion of the existence of an accompanying element of higher atomic weight, coupled with his excellent work generally in furthering the claims of the Periodic Law (notably in the cases of beryllium and of the cerium, lanthanum and didymium series), I would suggest that this new element, when isolated from its close union with tellurium, be called Bohemium, in his honour.

C. T. Blanshard.

Bright Meteors.

A pretty bright meteor crossed the eastern sky here on Saturday evening last, at about 7.54 p.m. I saw only the flash of light which it cast on the ground and in the sky towards the east, like a momentary weak red flash of lightning. "A shooting-star," said a bystander close to me, who saw it fairly well, and who gave me, roughly, this description, by the stars, of its apparent course: From about R.A. 340°, Decl. + 25°, to about 336°, + 12°. It described this course of 12° in about a second, and was red in colour, and broke up at last with a red flash, leaving no train of light or of sparks along the track which it had traversed, so long as for a second or two in which I had time to look towards the direction where he pointed. Tree-tops intercepted his view beyond the point of this disruption, but the light's sudden extinction there made a much further extension of the track unlikely.

About an hour afterwards, at about 8.49 p.m., I chanced to see another rather fine shooting-star, of about the brightness and colour of the planet Mars at present, descending some 16° or 18° across the northern sky in one and a-half or two seconds, from R.A. 47°, Decl. + 70°, to 100° + 69°, beginning and disappearing rather suddenly, and of nearly uniformly bright appearance all along its course. It projected no sparks, and, like the earlier meteor, left no train of light or enduring sparks along its track to mark its course.

Prolonged backwards the apparent paths of these two meteors diverge from near α Cassiopeiæ, and it may perhaps be that a shower of bright, ruddy meteors from the direction of Cassiopeia was in progress on that date, of which the two meteors here described may have been bright enough members to have been generally noted. The above observations, although those of the brighter meteor are only of rather slender accuracy, will perhaps be useful, in that case, to serve for comparison with other records which, at least of the larger meteor of the two, may not impossibly have been noted and preserved elsewhere.

A. S. Herschel.

Observatory House, Slough, October 1.

Tan-Spots over Dogs' Eyes.

Can any of your readers explain the meaning of the tan-spots seen so commonly over the eyes in black-and-tan dogs of most breeds?

When in Melbourne last year, I went carefully over all the dogs in a show, with one of the stewards, and we found the spots in all the black-and-tan terriers, foxhounds, deerhounds, collies, lurchers, &c.; but I could get no information regarding them from the experts.

In some of the highly-bred toy dogs, as the small black-and-tan terriers, I found on inquiry that these spots, formerly so very conspicuous, were being bred out, and had *nearly* disappeared. Their persistence through so many strongly-marked varieties, except those of late date, is singular, for there is fairly good proof that when first domesticated the dog was red or bright brown, like the pariah, dingo, &c.

As far as I can see, we do not find the spots white on a black or dark ground; nor yet black or dark on a white or light ground. My explanation is that they have arisen as a permanent marking after the dogs "sported" to black under domestication, and have been preserved and developed through natural selection. Possibly they are protective, and simulate *eyes*.

One morning, just at dawn, I had occasion to go out into the garden, and while stooping to examine some flowers, near a fence partly covered with creepers, I suddenly saw an animal's head looking through, and what seemed to be two black, and seemingly large, eyes glared at me. Suspecting that a black leopard was about to spring over, I started back, clapped my hands, and shouted. To my relief, however, I saw a tail wag, and found that the spectator was a coolie's dog I knew very well, and which recognised me. The use of the tan-spots—in this case at least—then occurred to me.

May it not be that the spots thus serve a protective purpose, and have often saved the lives of dogs (black dogs) from their enemies, the smaller felines, such as the clouded leopard, &c.? Perhaps the matter is not new; but if it is, it seems worth looking into.

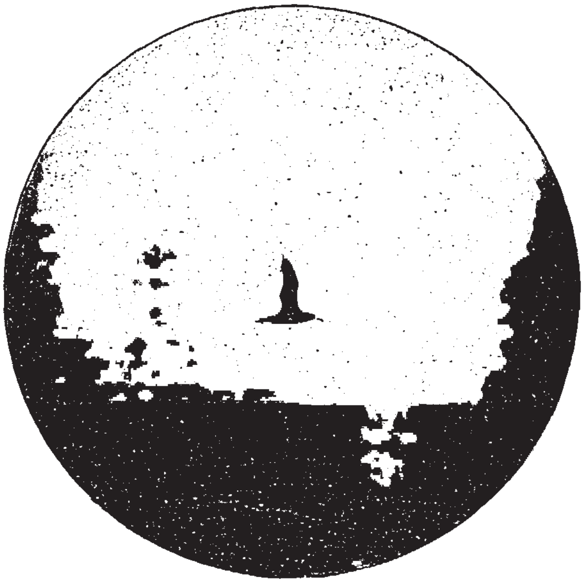
I have several dogs about here now with black bodies and heads; the tan-spots, rather pale, are of the size of a shilling. I have shot one, keeping the skin of the head as a curiosity.

Sibsagar, Asam, September 7. S. E. Peal.

Flight of the Albatross.

At the request of several friends, I enclose, for your inspection, a snap-shot of a northern albatross, which I took *en route* from Victoria, British Columbia, to San Francisco.

The photograph gives the bird in a position in which the human eye is incapable of seeing it. Strangely enough, the flight of the bird which I photographed had been during the whole course of the morning the subject of much discussion: none of us could imagine how the force which enabled it to fly at such great speed was generated. I remembered having seen some discussion in the papers on the subject, and stated that the matter had been settled to the satisfaction of scientific people, and did my best to explain the theory.



I chose the moment for my photograph when the bird was about fifteen feet from the camera, and sailing alongside of the steamer. The stretch of the wings was estimated by the

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